

Dermacentor taiwanensis Sugimoto, 1935 (Acarina: Ixodidae):
the immature stage and notes on hosts and distribution
in Japan

Shigeo KITAOKA

*First Research Division, National Institute of Animal
Health, Tsukuba Ibaraki, 305 Japan*

and

Hiroshi SUZUKI

*Department of Virology, Institute for Tropical Medicine,
Nagasaki University, Nagasaki, 852 Japan*

Abstract: The nymph and larva of *Dermacentor taiwanensis* Sugimoto, 1935, is described on the materials mainly from Amami-oshima, Japan. The adults are parasites of large wild animals and the immature ticks are those of small or medium-sized mammals in southern half of Honshu, Kyushu and the Nansei Islands.

INTRODUCTION

The tick species of the genus *Dermacentor* Koch found in Japan and its biology have been received only a little attention from previous workers¹⁾²⁾. Yamaguti *et al.* (1971) presented 4 figures of adults belonging to several species recorded from Japan and Korea in their monograph, but they did not dare to determine the name of those tick specimens due to lack of information on inter-specific variation among species of the genus in these areas. Wilson (1970) recognized approximately 18 species through Eurasia and presented summarized tables in his paper and suggested that detailed studies in the immature stages may disclose meaningful characters for distinguishing species.

In previous our papers²⁾³⁾, the host list of *D. taiwanensis* in Amami-oshima Is. and the distribution in Japan have reported by us. During later survey on ectoparasite of rodents and Amami rabbit (*Pentalagus furnessi*) in Amami-oshima considerable numbers of larval and nymphs specimens were recovered from the hosts. The present paper deals with the description of larva and nymph of *D. taiwanensis* and additional collection data of this species from Honshu and Kyushu.

All measurements in the text are given in millimeters.

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DESCRIPTION

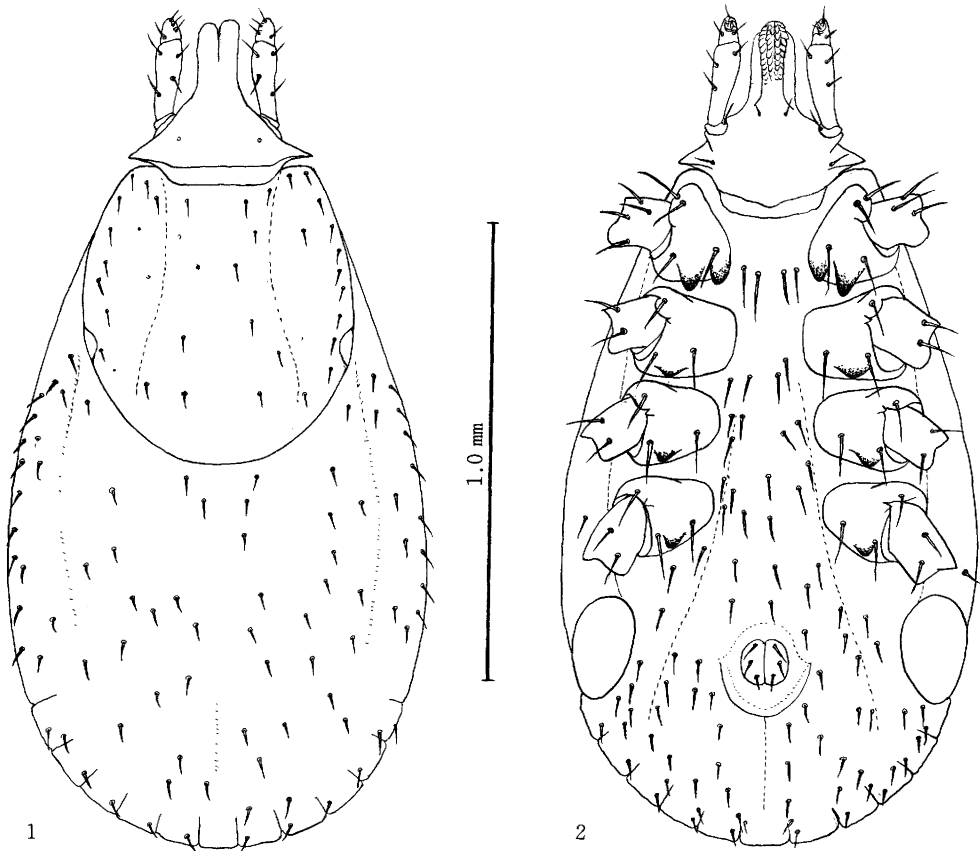
Nymph (Figs 1–5)

Body (Figs. 1, 2) 1.67–1.83 long, 0.93–0.98 broad.

Capitulum (Figs 3, 4) dorsally triangular, 0.38 long from palpal apices to posterior margin of basis; posterior margin nearly straight, posterolateral margins slightly concave. Basis capituli ventrally with rounded margin, posterolateral margins concave. Palpi ca 4.2 times as long as broad, external profile nearly straight, internal profile convex, apex rounded. Segment 1 distinct, single seta ventrointernally, segment 2 ca 2 times as long as segment 3; setae number 4 dorsally, 3 ventrally. Segment 3 setae number 4 dorsally, 3 ventrally, segment 4 situate in pit on mediointernal surface.

Hypostome (Fig. 5) ca 2.5 times as long as broad; apex bluntly rounded; corona small; dentition 2/3 or 3/3 in apical region, 2/2 posteriorly to base; denticles in ca 3, 8 and 9.

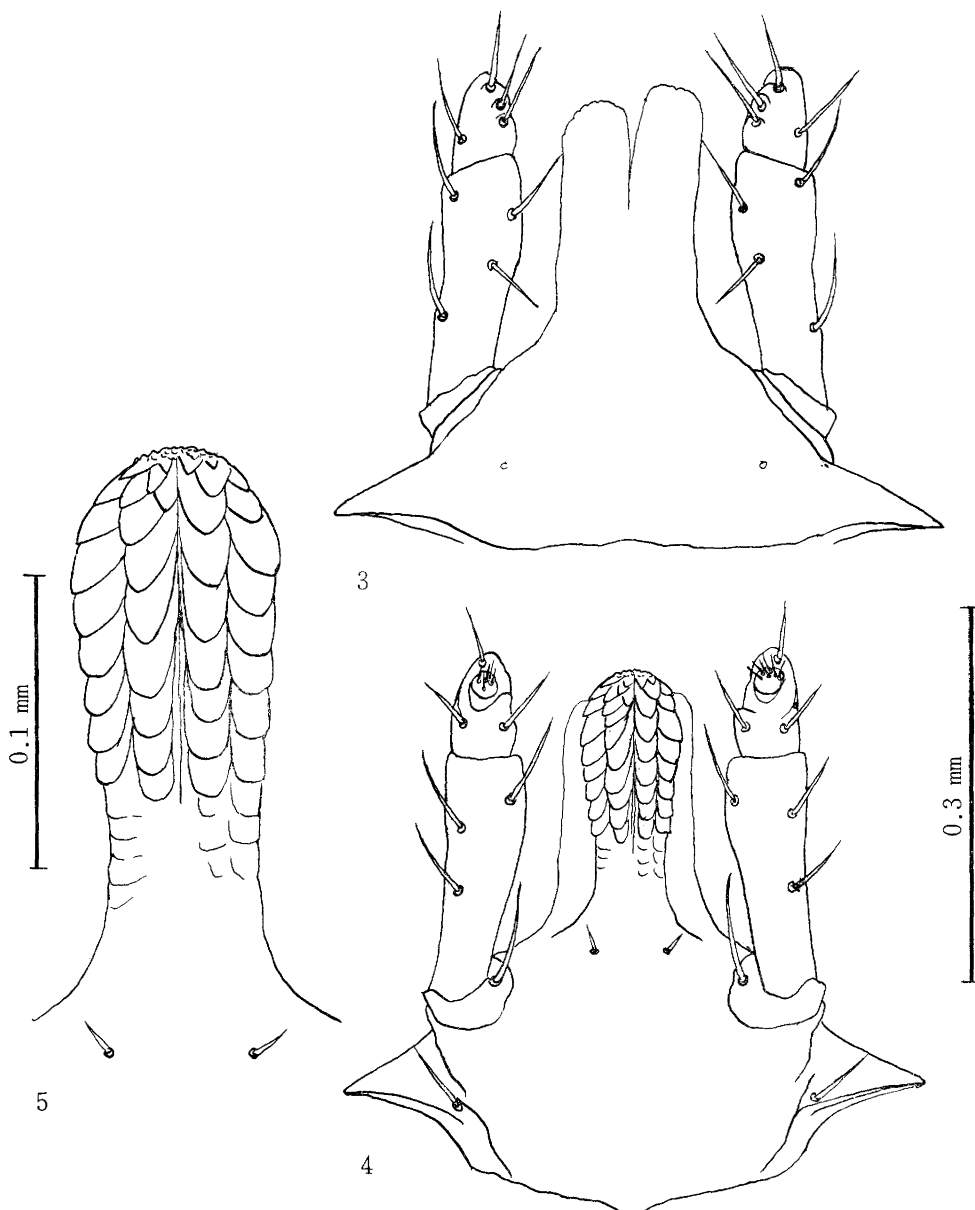
Scutum (Fig. 1) length and breadth subequal; anterior emargination broad, deep, scapular apices broadly rounded; external margin gradually diverging to level of half scutal length, posteroexternal junctions to posterior margin broadly round. Cervical



Figs 1, 2. *Dermacentor taiwanensis*, nymph dorsal and ventral views.

grooves shallow and beyond scutal midlength. Punctuation setiferous, number ca 10 in each lateral field, ca 10 in median field; setal length 0.014–0.02. Eyes a slightly convex, pale area in each posteroexternal juncture.

Dorsum (Fig. 1) as illustrated. *Venter* (Fig. 2) with a sensilla sagitifomes beside each coxal posteroexternal juncture; anus with 3 setae on each valve. Spiracular plate subcircular, 0.20×0.17 .



Figs 3–5. *Dermacentor taiwanensis*, nymph 3, 4, capitulum dorsal and ventral, 5. hypostome, ventral view.

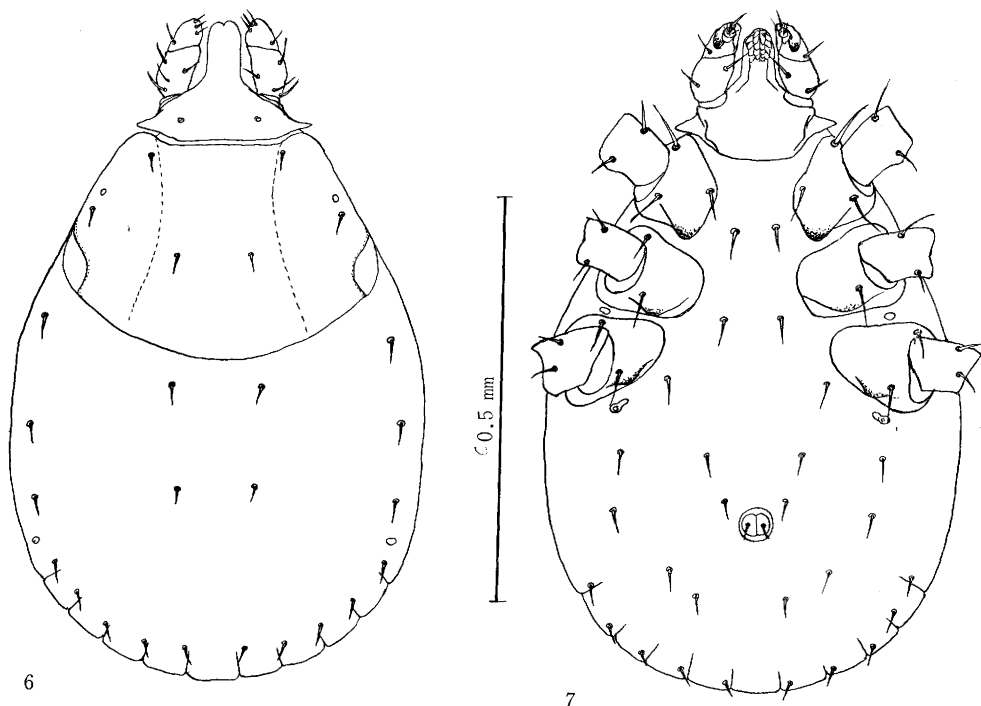
Legs (Fig. 2) moderately robust. Coxa I external spur broadly triangular and slightly larger than internal spur. Coxae II–IV each with broadly rounded subequal external spur; internal spur lacking. Setae number 4 on coxa I and 3 on coxae II–IV. Trochanter I dorsally lacking plate; trochanter ventrally unarmed. Tarsi II–IV moderately long, dorsal surface slightly humped proximally, gradually tapering distally. Claws moderate. Pulvilli reaching apical curvature of claws.

Larva (Figs. 6–10)

Body (Figs. 6, 7) ca 0.83 long, 0.68 broad in unfed specimens.

Capitulum (Figs. 8, 9) dorsally 0.16 long from palpal apices to posterior margin of basis; 0.20 broad, dorsal and ventral outlines as nymph; ventrally except that dorsally posteroexternal margin is not concave; dorsally with 2 small sensilla hastiformia; ventrally 1 pair posthypostomal seta. Palpi broadly convex in external outlines, each ca 2.5 times as long as broad and segment 1 distinct, segments 2 and 3 subequal in length. Setae number 0 on segment 1; 3 dorsally, 1 dorsointernally, 1 ventrally, and 1 ventrointernally on segment 2; 4 dorsally and 2 ventrally on segment 3. *Hypostome* (Fig. 10) ca 2.7 times as long as broad; denticles in files of 7 or 8.

Scutum (Fig. 6) 1.4 times as broad as long; anterior emargination broad, shallow; scapulae rounded; external margin gradually diverging to convex posterior margin. Cervical grooves shallow, extending beyond scutal midlength. Punctations setiferous Sc₁ 0.027, Sc₂ 0.019, Sc₃ 0.017. Eyes as a large, slightly convex, plate area in each pos-

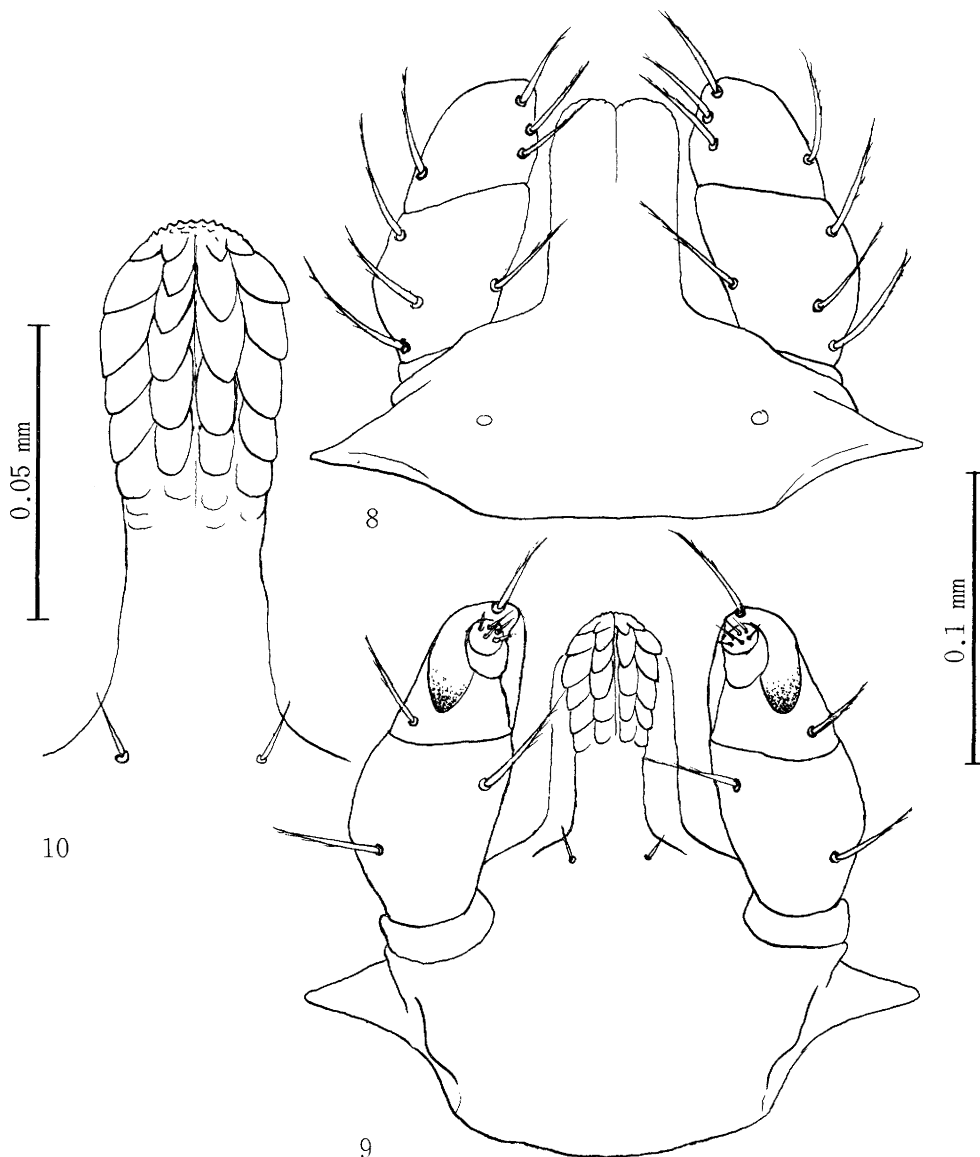


Figs 6. 7. *Dermacentor taiwanensis* larval dorsal and ventral views.

teroexternal juncture.

Dorsum (Fig. 7) 2 pairs of Cd, 0.020; 8 pairs of Md; Md₁ 0.025, and Md₈ 0.017.

Legs (Fig. 7) long, moderately robust. Coxa I with a broadly rounded spur-like ridge extending beyond posterior margin: II and III each with smaller, broadly rounded ridge attaching posterior margin. Tarsi moderately elongate, dorsal surfaces slightly humped proximally, gradually tapering distally. Claws I larger than II and III. Pulvilli I reaching almost to apical curvature of claws, but II and III not.



Figs 8–10. *Dermacentor taiwanensis*, larval capitulum dorsal and ventral views, 10, hypostome, ventral view.

HOST AND DISTRIBUTION

Data of the specimens examined are given in Table 1. Although no chances to rear them for association between each developmental stage, no significant differences were noticed in the characters among those specimens in the same stage which were collected from different localities to be sorted into several groups. Therefore, we concluded that the specimens examined are conspecific and are identified those of larva, nymph or adult of *D. taiwanensis* and a single species of the *Dermacentor* distribute in the areas surveyed.

Another species of the genus *Dermacentor* has been recorded several times from only horses in northern Japan before 1948. This was identified as *D. reticulatus* by the previous workers⁷⁾ and appears to be *D. silvarum*. After World War II, Dr. T. Ishihara, ex-staff of the senior author's Institute, has tried to collect aiming the *Dermacentor* ticks from a pasture in which horses had been parasitized them, but he has found none of the aimed ticks. It was supposed that only locally inhabiting populations

Table 1. *Dermacentor taiwanensis* and associated ticks collected from vegetation or various host mammals.

Host or mode of collection	Place	Date	No. of host or Infested/Examined	<i>D. taiwanensis</i>				<i>H. hystricis</i>			<i>H. pentalagi</i>				
				F	M	N	L	F	N	L	F	M	N	L	
Flagging	Susami, Wakayama	1971 VIII 25		1											
〃	Mt. Inokawadake, Tokuno-shima	1973 II 25		1											
〃	Mt. Tanzawa, Kanagawa	1973 V 10		1											
〃	Mt. Gozadake, Iriomote	1974 I 15					2								
〃	Mt. Sanpodoridake Tokuno-shima	1974 III 8								1					
〃	Mt. Ibudake, Okinawa	1976 XI 27									13				
<i>Selenarctos thibetanus japonicus</i>	Ashio, Kyoto	1971 VII 15	1	1	2										
<i>Apodemus s. speciosus</i>	Nagayo, Nagasaki	1976 IV 16	2				1								
<i>Sus riukiuanus</i>	Amai-oshima, Kagoshima	1972 II 4 XI 10	1	1											
<i>Tokudaia osimensis</i>	〃	1975 II ~ VI	20/114			4	36	2	133	242					
<i>Rattus r. rattus</i>	〃	1975 II ~ IV	21/40			7	111		8	34					
<i>Pentalagus furnessi</i>	〃	1979 II 15	2				2				143	46	412	400	

of *D. silvarum* were established temporarily in some pastures after introducing infested horses with *D. silvarum* from Siberia, but later they are extinct from those pastures due to a stop to raising horses.

Records of *D. taiwanensis* adults are primarily from wild boars and less from Japanese black bears and no records are from human beings and domestic animals yet. The larval and nymphal ticks may infest on other forest dwelling small or medium-sized mammals other than the animals listed in Table 1. The present data also manifest that the distribution of *D. taiwanensis* is ranging from southern half of Honshu and Kyushu to Iriomote Is. through the Nansei Islands and then extends to Taiwan. Saito (1973) reported the presence of a *Dermacentor* tick in Shikoku, which appears to be supposedly *D. taiwanensis*.

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タイワンカクマダニ (ダニ類: マダニ科): 未成熟期の形態, 宿主, 分布
北岡茂男 (家畜衛生試験場研究第1部), 鈴木 博 (長崎大学熱帯医学研究所ウイルス学部門)

わが国のマダニ科6属の中でカクマダニ属 (*Dermacentor*) の種類は, これまで成虫の形態が図示された程度で, 未成熟期やその生態は殆ど不明のままである.

著者ら (1973) は先に奄美大島のイノシシからタイワンカクマダニ *D. taiwanensis* を記録したが, 更に幼・若虫の多くの材料がえられたのでその形態を初めて記載した. 本州, 九州, 南西諸島からの *Dermacentor* 属の各期の標本を形態学的に比較した結果, 土産種は本種1種のみであると結論された. 成虫はイノシシ, クマなど, 若・幼虫は中・小型の哺乳動物を宿主としている.